

CLAIMS

1. A carbonaceous protective layer for protecting an underlying material, which is a layer formed by a Filtered Cathodic Arc process, and contains nitrogen
5 distributed therein.
2. A carbonaceous protective layer according to claim 1, wherein a nitrogen content of said carbonaceous protective layer is 2 to 20 at%.
3. A carbonaceous protective layer according to claim 1, wherein nitrogen is distributed in an inclined concentration in said carbonaceous protective layer, and a nitrogen concentration is gradually increased from a bottom surface side to a top surface side in said carbonaceous protective layer.
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4. A carbonaceous protective layer according to claim 1, wherein nitrogen is not contained in a substantially lower half portion, occupying substantially one half of the thickness-wise distance from a bottom surface of said carbonaceous protective layer.
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5. A carbonaceous protective layer according to claim 1, wherein a hardness of said carbonaceous protective layer is at least 18 GPa.
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6. A carbonaceous protective layer according to claim 1, wherein a contact angle of said carbonaceous protective layer to water is not greater than 35°.
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7. A carbonaceous protective layer according to any one of claims 1 to 6, wherein said carbonaceous protective layer is positioned over a magnetic recording layer of the magnetic recording medium.
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8. A magnetic recording medium comprising a non-magnetic substrate having applied thereon a magnetic recording layer, in which said magnetic recording layer has a carbonaceous protective layer formed thereon by a Filtered Cathodic Arc process, and said carbonaceous protective layer contains nitrogen distributed therein.
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9. A magnetic recording medium according to claim 8, wherein a nitrogen content of said carbonaceous

protective layer is 2 to 20 at%.

10. A magnetic recording medium according to claim
8, wherein nitrogen is distributed in an inclined
concentration in said carbonaceous protective layer, and
5 a nitrogen concentration is gradually increased from a
bottom surface side to a top surface side in said
carbonaceous protective layer.

11. A magnetic recording medium according to claim
8, wherein nitrogen is substantially not contained in a
10 lower half portion, occupying substantially one half of
the thickness-wise distance from a bottom surface of said
carbonaceous protective layer.

12. A magnetic recording medium according to claim
8, wherein a hardness of said carbonaceous protective
15 layer is at least 18 GPa.

13. A magnetic recording medium according to claim
8, wherein a contact angle of said carbonaceous
protective layer to water is not greater than 35°.

14. A method of producing a magnetic recording
20 medium comprising a non-magnetic substrate having applied
thereon a magnetic recording layer, which has a
carbonaceous protective layer deposited thereon, which
method comprises the step of depositing said carbonaceous
protective layer on said magnetic recording layer by a
25 Filtered Cathodic Arc process, while introducing nitrogen
into said carbonaceous protective layer.

15. A method of producing a magnetic recording
medium according to claim 14, wherein nitrogen is
introduced in said carbonaceous protective layer under
30 the conditions that a nitrogen concentration is gradually
increased from a bottom surface side to a top surface
side in said carbonaceous protective layer.

16. A method of producing a magnetic recording
medium according to claim 14, wherein nitrogen is
introduced in said carbonaceous protective layer under
35 the conditions that nitrogen is substantially not
contained in a lower half portion, occupying

substantially one half of the thickness-wise distance from a bottom surface of said carbonaceous protective layer.

17. A method of producing a magnetic recording medium according to any one of claims 14 to 16, wherein said carbonaceous protective layer is deposited under irradiation of a nitrogen ion beam, or under the application of a nitrogen atmosphere or by combining them together, thereby introducing nitrogen into said carbonaceous protective layer.

18. A magnetic disk apparatus comprising a recording head for recording information and a reproducing head for reproducing information to and from a magnetic recording medium, in which said magnetic recording medium comprises a non-magnetic substrate having applied thereof a magnetic recording layer, and said magnetic recording layer has a carbonaceous protective layer, formed thereon by a Filtered Cathodic Arc process, which contains nitrogen distributed therein.

19. A magnetic disk apparatus according to claim 18, wherein nitrogen is distributed in an inclined concentration in said carbonaceous protective layer, and a nitrogen concentration is gradually increased from a bottom surface side to a top surface side in said carbonaceous protective layer.

20. A magnetic disk apparatus according to claim 18, wherein nitrogen is substantially not contained in a lower half portion, occupying a substantially one half of the thickness-wise distance from a bottom surface of said carbonaceous protective layer.